Appendix B-3

Electrical Safe Design of Facilities Checklist

Purpose: This checklist identifies electrical design requirements for facility electrical distribution systems. Safe design mitigates exposure of workers to electrical hazards which can result in system failure, fire, as well as injury or death, and enhances reliability.

Requirements: Occupational Safety and Health Administration (OSHA) 29CFR 1910.303 through 1910.308, 1910.334 through 1910.335; and 1926.403 through 1926.408 for construction; National Fire Protection Association (NFPA) 70, the National Electric Code (NEC); NFPA 70E Electrical Safety in the Workplace; DA Pam 385-26: The Army Electrical Safety Program.

Applicability: This checklist is a tool to aid the planner, designer, and safety professional to maximize the quality of facility electrical distribution systems. The checklist should incorporated by Contracting Officer's Representatives (CORs) as a statement of requirements for facility electrical system design. It serves as a basis for review and acceptance of plans and specifications for construction projects.

DOCUMENT CHANGE TABLE			
DATE	AUTHOR	CHANGES MADE	VERSION

Electrical Safe Design of Facilities Checklist

NFPA 70 NEC 2011

Number	Item	NEC or Other Reference	Comments
Rough Underground Inspection Questions			
1	What type of occupancy?	NEC Articles 210, 220, 225, 240, 250, etc. NFPA 101, Ch. 6	
2	What types of wiring methods are being used?	NEC Chapter 3	
3	Are the wiring methods suitable for the location?	Chapter 3	
4	Is the conduit fill expected to be within the maximum allowable NEC Table 1, Chapter 9?	Chapter 9	
5	Does the number of bends in conduit exceed 360 degrees?	Articles 342 - 356	
6	Is the wiring method listed and are listed fittings used?	Chapter 3	
7	Does the installation match that shown on the blueprints?	Local code - Authority Having Jurisdiction	
8	Are there any special grounding and bonding requirements (such as for patient care locations)?	Article 250	
9	Is the workmanship suitable and are the fittings made up tight?	Article 110	
10	Is corrosion protection a concern for the wiring method used?	Chapter 3	
11	Is a concrete-encased electrode present?	Chapter 2, 250.52(A)(3)	
12	Are suitable floor boxes, under-floor raceways installed properly?	314.27(B)	
13	Are burial depths for wiring methods in accordance with the minimum required by Table 300.5 and 300.50?	300.5 and 300.50	
Rough Underground Inspection Checklist			
14	Determine which installations or portions of the installations are covered by NEC rules 90.2(A) and (B).	90.2(A) and (B)	
15	Verify equipment is listed and installed in accordance with manufacturer's installation instructions.	90.7 and 110.3(A) and (B)	
16	Verify which wiring method is used and it is listed for the purpose.	110.8, 110.3(A) and (B); and Chapter 3, Article 300	
17	Verify floor boxes are listed for the purpose.	314.27(B) and (C), 110.3(B).	
18	Verify wiring method burial depths in accordance with Table 300.5 or Table 300.50.	Table 300.5 and Table 300.50.	
19	Check for maximum number of bends not to exceed 360 degrees.	Applicable wiring method (.26), Examples: Article 344, Rigid Metal Conduit Type RMC, 344.26; Article 348, Flexible Metal Conduit Type (FMC), 348.26; etc.	

Number	Item	NEC or Other Reference	Comments
20	Verify if concrete-encased electrode and other electrodes are present either horizontal or vertical.	250.50, and 250.52(A)(3)	
21	Hand hole enclosures are designed and installed to withstand any loads likely to be imposed and they shall be identified for use in underground systems.	314.30	
22	Check for corrosion protection of metal conduit or boxes.	300.6, 110.11	
23	Verify feeder conduit sizes in accordance with single line drawings. Table 300.1(C), Chapter 9 Tables.	300.1(C), Chapter 9 Tables.	
24	Check any underground cable installed for suitability.	110.3, 300.5, and 300.50.	
25	Check direct buried conductors or emerging cables are protected from physical damage.	300.5(D)(1) through (D)(4)	
Electrical Checklist General Requirements Questions			
26	Is the electrical installation covered by the National Electrical Code?	Article 90	
27	What are the required interrupting ratings for the service and distribution equipment?	Article 110	
28	What are the supply system voltage(s) and phase configurations?	Article 430 for motors and motor circuits	
29	What are the electrical loads in the building or structure?	Article 220	
30	Are the terminations in accordance with minimum requirements?	Chapter 2	
31	Are the minimum working spaces provided at electrical equipment?	110.32- 110.34	
32	Are all required labels and identification marks on equipment?	110.16, arc flash, 110.21-.22	
33	Is installed equipment listed and suitable for the use?	Article 110	
34	Are all working space personal doors (are any personal doors within 25 ft of working space) equipped with simple pressure hardware and open in the direction of egress?	110.26	
General Requirements			
35	Determine which installations or portions of the installations are covered by NEC rules.	90.2(A) and (B)	
36	Verify equipment is listed and installed in accordance with manufacturer's installation instructions and suitable for the location.	90.7, 110.3(A) and (B), 110.20	
37	Identify any special equipment or systems that require special approvals or evaluations.	90.4, 90.7, 110.2, 110.3	
38	Verify service and distribution equipment has sufficient interrupting ratings for AFC (available fault current) and system is fully rated.	110.9, 110.10	
39	Is service and distribution equipment being installed as a fully rated system or as a series combination rated system?	110.9, 110.10, 240.86	

Number	Item	NEC or Other Reference	Comments
40	Check for electrical enclosures and boxes with unused openings. Verify closure of raceway and cable openings	110.12(A), 408.7	
41	Verify equipment has not been contaminated by foreign materials or is not damaged.	110.12(B)	
42	Verify equipment is securely mounted and adequate ventilation and space for the equipment is provided	110.13	
43	Check electrical splices and equipment terminations.	110.14(A) and (B)	
44	Check temperature ratings of terminations.	110.14(C)	
45	Check for arc flash warning labels and locations of labels.	110.16	
46	Check for minimum working spaces at electrical equipment. Verify working space is not used for storage.	110.26(A), (B), (E), 110.32, 110.34(A)	
47	Check the space above and below equipment for no foreign equipment (Dedicated Equipment Space).	110.26(F)	
48	Verify entrance and egress to work spaces. Any personal doors to or within 25 ft. of working space requires panic hardware and must open in the direction of egress.	110.26(C)(1), through 110.26(C)(3), 110.33	
49	Verify illumination is provided for equipment.	110.26(D), 110.34(D)	
50	Check for circuit directories, and identification of disconnecting means and source of supply.	110.22, 408.4(A) and (B)	
Rough Walls Inspections Questions			
51	What type of occupancy?	NEC Articles 210, 220, 225, 240, 250, etc. NFPA 101, Ch. 6	
52	What types of wiring methods are used?	Chapter 3	
53	Are the wiring methods secured and supported and protected properly?	Chapter 2 & Ch. 3	
54	Conduit fill and conductor fill at boxes is not exceeded?	Chapter 3	
55	Is the wiring method listed and are listed fittings used?	Chapter 3	
56	Does the installation match that shown on the blueprints?	Local Code	
57	Are there any special grounding and bonding requirements (such as for patient care locations)?	Article 250	
58	Is the workmanship suitable and are the fittings made up tight?	Article 110	
59	Is there a branch circuit identification requirement?	Chapter 2 and Chapter 3	
60	Is wiring method protected from physical damage where needed or required?	Article 300	
Rough Wall Inspection Checklist			
61	Verify the wiring method is suitable for the use based on the uses permitted section of the applicable article.	Article 300 wiring methods	

Number	Item	NEC or Other Reference	Comments
62	Verify equipment is listed and installed in accordance with manufacturer's installation instructions.	90.7 and 110.3(B), 110.20	
63	Check wiring methods (usually conduit and flexible metal conduit) for support and suitability for the conditions.	Chapter 3 and Article 300, 300.11	
64	Check box accessibility, mounting, and length of free conductors.	314.29, 300.14	
65	Check for proper box sizes, fill capacity, and locations.	300.15, 314.16(A) and (B)	
66	Verify adequate conduit or tubing sizes for fill capacity.	300.17, Chapter 9 Tables	
67	Check for suitable box supports.	314.23, 300.11	
68	Verify boxes are roughed in a manner that will result in flush outlet boxes to wall surfaces	314.20, 314.19	
69	Verify conductors entering boxes are protected from abrasion.	314.17	
70	Verify pull and junction box sizes for 4 AWG or larger.	314.28	
71	Verify metal boxes are grounded in accordance with Article 250.	314.4	
72	Verify that cables are secured to the cabinet, cutout box, or meter socket enclosure.	312.5(C)	
73	Verify that all unused openings are effectively closed.	110.12(A), 314.17(A)	
74	Check for proper physical protection for wiring methods installed in framing members.	300.4	
75	Verify all conductors of the circuit are routed with each other.	300.3(B)	
76	Verify that wiring methods are continuous from outlet to cabinets, boxes, or other enclosures.	300.12, 300.18	
77	Verify mechanical and electrical continuity of conductors.	300.13(A) and (B)	
78	Verify continuity of metal raceways and enclosures.	300.10	
79	Check for required applicable fire rated caulking and penetrations.	300.21	
80	Check for proper boxes where barriers are needed between 277-volt switches and receptacles or other adjacent devices where voltage between switch terminals exceeds 300 volts.	404.8(B), 406.4(G)	
81	Verify applicable ADA switch, receptacle mounting heights.	ANSI A117.1	
82	Verify mounting of flush panel boards, boxes and enclosures with no more than ⅛ in. gap.	312.3, 314.20, 312.4	
83	Check conductor sizes for capacity and over current protection.	310.15, 310.16, 240.4	
84	Verify the installation matches the engineered drawings if applicable	Local Code	
Rough Ceiling Electrical Inspections Questions			

85	What type of occupancy?	NFPA 101, Ch. 6	
Number	**Item**	**NEC or Other Reference**	**Comments**
86	Are the wiring methods secured and supported and protected from physical damage properly?	Chapter 3	
87	Conduit fill and conductor fill at boxes is not exceeded?	Chapter 3	
88	Does the number of bends in conduit exceed 360 degrees?	Articles 342 - 356	
89	Is the wiring method listed and are listed fittings used?	Chapter 3	
90	Does the installation match that shown on the blueprints?	Local Code	
91	Are there any special grounding and bonding requirements (such as for patient care locations)?	Chapter 2, Article 250	
92	Is the workmanship suitable and are the fittings made up tight?	Article 110	
93	Is there a branch circuit identification requirement?	Chapter 2, Article 210	
94	Are the luminaires and other equipment supported properly?	Article 410	
95	Are the luminaires listed?	Article 410	
96	Wiring methods are installed in plenums, are wiring methods properly rated for plenum use?	Chapter 3	
97	Are cables and raceways installed under roof decking properly protected from physical damage?	Chapter 3	
Rough Ceilings Electrical Inspections Checklist			
98	Determine which installations or portions of the installations are covered by which NEC rules (type of occupancy, etc.)	90.2(A) and (B)	
99	Verify equipment is listed and installed in accordance with manufacturer's installation instructions.	90.7 and 110.3(B)	
100	Check wiring methods (usually cable, conduit, or flexible metal conduit) for support and suitability for the conditions.	Chapter 3 and Article 300, 300.11	
101	Verify the wiring method is suitable for the use based on the uses permitted section of the applicable article.	Chapter 3 wiring methods	
102	Check for proper box sizes and fill capacity and locations.	300.15, 314.16(A) and (B)	
103	Verify adequate conduit or tubing sizes for fill capacity.	300.17, Chapter 9 Tables	
104	Check for suitable box supports.	314.23, 300.11	
105	Verify boxes are roughed in a manner that will result in flush outlet boxes to wall surfaces.	314.20, 314.19	
106	Verify conductors at entering boxes are protected from abrasion.	314.17	
107	Verify pull and junction box sizes for 4 AWG or larger.	314.28	
108	Verify metal boxes are grounded in accordance with Article 250.	314.4	

Number	Item	NEC or Other Reference	Comments
109	Verify that cable entries into flush cabinets are effective and closed.	312.5(C)	
110	Verify that all unused openings are effectively closed.	110.12(A), 314.17(A)	
111	Check for proper physical protection for wiring methods installed in framing members and other locations.	300.4	
112	Verify all conductors of the circuit are routed with each other	300.3(B)	
113	Verify that wiring methods are continuous from outlet to enclosure.	300.12	
114	Verify mechanical and electrical continuity of conductors.	300.13(A) and (B)	
115	Verify continuity of metal raceways and enclosures.	300.10	
116	Verify raceways are complete between enclosures, boxes, etc.	300.18	
117	Check for required applicable fire rated caulking and penetrations.	300.21	
118	Check conductor sizes for capacity and over current protection	310.15, 310.16, 240.4	
119	Verify the installation matches the engineered drawings if applicable.	Local Code	
120	Verify luminaires are securely fastened to ceiling grid or structure.	410.36(C), 410.30	
121	Verify clearances from thermal insulation and combustible materials are adequate.	410.116	
122	Verify all electrical boxes and enclosures are covered and accessible	314.25, 314.29	
123	Verify limited energy system cabling is securely supported to the building structure in a workmanlike manner	725.24, 760.24, 770.24, 800.24, 820.24, 830.24	
124	Verify local disconnecting means for indoor florescent luminaires.	410.130(G)	
125	Check to see that luminaires are listed (if installed on ceiling rough, typically not installed until final inspection).	410.6	
126	Verify cables and wiring methods in air handling spaces are suitable for the purpose and listed.	300.22, 725.154, 760.154, 760.176, 770.154(A), 800.154(A), 820.154(A), 830.154(A)	
127	Verify emergency system enclosures (junction boxes are readily identified and in separate wiring methods (if applicable).	700.7, 700.10(A)	
128	Track lighting supported properly	410.151(D), 410.154	
129	Verify disconnect means and locations for equipment above suspended ceilings.	440.14, 430.102, 422.31	
130	Check to be sure all temporary wiring is disconnected and removed.	590.3(D)	
131	Verify that no flexible cords are installed above suspended ceiling.	400.8	

Number	Item	NEC or Other Reference	Comments
132	Verify minimum 1½ in. spacing between metal corrugated sheet roof decking and conduits or cables.	300.4(E)	
Branch Circuit Electrical Inspections Questions			
133	Do the branch circuits match what is shown on the plans and in the panel schedules?	Local code	
134	What are the minimum sizes for the required branch circuits?	Chapter 2, Article 210	
135	Is over current protection sized properly for the branch circuits?	Chapter 2	
136	Are the branch circuit conductor sizes adequate for the load?	Chapter 2	
137	Is over current protection properly coordinated (series rated systems)?	Chapter 2	
138	What conduit types or wiring methods are used for the branch circuits and are the sizes adequate?	Chapter 2	
139	Are branch circuits installed in proper wiring method based on the type of occupancy?	Chapter 2	
140	Are there any multi-wire branch circuits installed?	Chapter 2	
141	Does more than one voltage electrical system exist in the building or structure?	Chapter 2	
142	Is there an electric sign and outline lighting branch circuit provided?	Chapter 2	
143	Are there enough branch circuits to meet the minimum loading requirements of 220.3?	Chapter 2	
144	Are there any branch circuits with added requirements such as grounding provisions?	Chapter 2 and Chapter 3	
145	Are there any branch circuits installed on rooftops, which are subject to specific derating of conductor?	Chapter 3	
Branch Circuit Requirements Checklist			
146	Verify type of occupancy and wiring methods are suitable for that type of occupancy.	Chapter(s) 3 and 5	
147	Check for proper sizes of branch circuits.	210.19, 310.16, 240.4(D)	
148	Verify proper sizes for branch circuit over current protection, over current device rating and interrupting rating	210.20, 240.4, 408.30, 110.9, 110.10, 240.86	
149	Check for individual and multiple outlet branch circuits ratings	210.3, 210.23	
150	Verify the continuous loads and the non-continuous loads and the circuit sizes.	210.19, 210.20, 310.15	
151	Verify the branch circuit loads do not exceed the maximum loads allowed.	220.10 thru 220.14, 220.18	
152	For motors and HVAC equipment verify the branch circuits meet the requirements in Article 430 and 440.	240.14(C), 430.22, 430.24, 440.31 thru 440.35	
153	Check that the loads on the circuit do not exceed the circuit rating.	210.23	
154	Verify that the branch circuits are enough for the load served and the load is evenly distributed.	210.11	

Number	Item	NEC or Other Reference	Comments
155	Check that the branch circuits for specific loads meet the requirements of that particular article.	210.2	
156	Verify multi-wire branch circuits for proper use and identification.	210.4, 210.5	
157	Verify simultaneous disconnects for all multi-wire branch circuits.	210.4(B)	
158	Verify grouping of multiwire branch circuits in at least one location within the panel board.	210.4(D)	
159	Check for lighting and receptacles at mechanical equipment locations.	210.63, 210.70(C)	
160	Check for required location of outlets at show windows and signs.	210.62, 600.5(A), 220.14(G) and (F)	
161	Verify that receptacles are provided for any cord- and plug-connected equipment.	210.50, 400.7, 400.8	
162	Check for GFCI protection in bathrooms, kitchens, rooftops, outdoors, and sinks.	210.8(B)	
163	Check for GFCI protection for pools, vending machines, and drinking fountains.	Article 680, 422.51,422.52	
164	Check for disconnects in branch circuits supplying other buildings or structures.	Article 225, Part II	
165	Check for outside branch circuits' overhead clearances and sizes.	225.6, 225.18, 225.19	
166	Verify that proper identification is used for grounded (usually neutral) conductors.	200.6(A) and (B)	
167	Verify that different means of identification where more than one nominal voltage system is used and the two systems occupy the same raceways or enclosures.	200.6(D), 210.5(C)	
168	Verify no over current device is inserted in any grounded conductor.	240.22	
169	Verify identification means for ungrounded branch circuit conductors has been established and posted where wiring system is supplied by more than one nominal voltage system.	210.5(C)	
170	Verify that any branch circuit conductors installed on or above rooftops are derated for ampacity.	310.15(B)(2)	
Equipment Bonding and Grounding Questions			
171	What equipment is supplied by the service or system?	Article 250	
172	Is the equipment required to be grounded or bonded or both?	Article 250	
173	What type of equipment grounding conductor is used?	Article 250	
174	What type of equipment bonding jumper(s) is used?	Article 250	
175	What is the rating of the over current device protecting the circuit and equipment?	Article 250	
176	What size circuit conductor are installed (is voltage drop a concern)?	Article 250	
177	What type of equipment grounding conductor connections is installed?	Article 250	

Number	Item	NEC or Other Reference	Comments
178	Are equipment grounding conductor sizes adequate?	Article 250	
179	Have equipment grounding conductors been properly identified?	Article 250	
180	Are the intersystem bonding terminations installed properly at the service equipment location?	Article 250	
Equipment Bonding and Grounding Checklist			
181	Verify which equipment is required to be grounded.	250.110, 250.112, 250.114, 250.116	
182	Check for appropriate grounding methods for equipment.	250.134, 250.136, 250.118	
183	Verify types of equipment grounding conductors used.	250.118	
184	Check separate equipment grounding conductor for proper sizing (voltage drop, etc.)	250.122	
185	Check load side equipment bonding jumper sizes.	250.102(D)	
186	Verify proper identification of equipment grounding conductors (wires).	250.119	
187	Verify equipment grounding conductor connections within boxes.	250.8, 110.3(B), 250.146, 250.148	
188	Verify proper bonding of grounding type receptacles.	250.146, 250.8, 110.3(B), 250.146	
189	Check for equipment grounding terminal bars in panel boards and equipment	408.40, 250.8	
190	Verify grounding and bonding methods at separate buildings or structures.	250.32(B)	
191	Check method of grounding for ranges and dryers.	250.140, 250.142	
192	Verify proper connections of isolated, insulated equipment grounding conductors.	250.146(D), 250.4(A)(5), 406.2(D), 408.40, 250.96(A) and (B)	
193	Verify any auxiliary electrodes are not used as the ground fault current return path.	250.54, 250.4(A)(5), 250.4(B)(4)	
194	Check metal sheath and raceway bonding for circuits with a phase to ground voltage exceeding 250.	250.97	
195	Verify any special occupancy grounding and bonding requirements (health care facilities, etc.)	517.13, Article 550, Articles 500 – 516, 517, 551, 547, etc.	
196	Verify any special equipment grounding and bonding requirements (swimming pools, elevators, etc.)	250.3, Articles 680, 600, 620, etc.	
197	Verify equipment grounding conductor qualifies as an equipment grounding conductor	250.118	
198	Verify isolated insulated equipment grounding conductors are installed to meet the requirements	250.146(D), 406.2(D), 408.40 Ex., 250.96, 250.4(A)(5), 250.54	
199	Check any limited energy system bonding and grounding requirements.	800.100, 810.21, 820.100, 830.100, 250.94	

Number	Item	NEC or Other Reference	Comments
200	Verify intersystem bonding termination at service equipment or separate building or structure.	250.94	
Electrical Service Inspections Questions			
201	Is there one service? If more than one, how many and what are the locations?	Chapter 2, Article 230	
202	Are the service conductors overhead or underground?	Chapter 2, Article 230	
203	What is the required voltage and short circuit current rating for the service?	Chapter 2, Article 230	
204	Are the service conductors sized per minimum requirements, and large enough to serve the calculated load?	Chapter 2, Article 230	
205	What is the current rating of the service equipment?	Chapter 2, Article 230	
206	Is the equipment suitable for the locations and protected?	Chapter 2, Article 230	
207	How many buildings served by the service?	Chapter 2, Article 230	
208	How many service disconnects and what are the locations?	Chapter 2, Article 230	
209	Are the service disconnecting means accessible?	Chapter 2, Article 230	
210	Have the minimum height requirements for service disconnects been meet?	Chapter 2, Article 230	
Electrical Service Inspections Checklist			
211	Determine each building has one service or more as allowed by justified provisions.	230.2	
212	Check that each service drop or lateral supplies one set of service conductors.	230.40	
213	Verify that the service conductors are sized per minimum requirements, and large enough to serve the calculated load.	230.23(B), 230.31(B), 230.42	
214	Verify that service entrance conductors are listed or marked as being sunlight resistant or covered.	310.8(C)	
215	Verify clearances for overhead service drop conductors	230.24	
216	Verify the point of attachment is adequate.	230.26, 230.27	
217	Verify that if the service mast is used to support the Verify that if the service mast is used to support the drop, it only supports the electrical service conductors and is adequate for this purpose.	230.28	
218	Verify depths for buried service lateral conductors.	230.32, 230.49, 300.5, 300.50	
219	Check wiring methods for the service conductors.	230.43	
220	Verify service weather head locations and raceways are suitable for wet locations and arranged to drain.	230.53, 230.54	
221	Check that service equipment is suitable for the use as service equipment and identified as such.	230.66	
222	Check the size of the service conductors.	230.23, 230.31,	
223	Verify that a service disconnect is provided, located properly and accessible.	230.70, 230.204, 230.205, 240.24	

Number	Item	NEC or Other Reference	Comments
224	Verify over current devices are not located where they are in the vicinity of easily ignitable materials or over steps or stairways.	240.24(D) and (F)	
225	Check the over current protection at the load end of the service-entrance conductors	230.90, 230.91, 230.208	
226	If multiple service disconnects are used, verify no more than six and that they are grouped together.	230.71, 230.72, 230.204, 230.205	
227	Generally, service equipment must be readily accessible and installed so that the center grip of the operating handle, when in its highest position, is not more than 2.0 m (6 ft 7 in.) above the floor or working platform.	240.24(A)	
228	Check the service disconnect ratings.	230.79, 230.80, 230.205	
229	Verify any equipment connected to the supply side of the service disconnect is permitted on supply side.	230.82	
230	Verify service disconnect identification.	230.70(B) and (C)	
231	Is equipment protected from physical damage?	110.27	
232	Verify GFPE is provided where required for the service	230.95	
233	If GFPE is present in the service equipment, verify performance testing completed prior to energizing	230.95(C)	
234	Are barriers provided that isolate the service bus bars from inadvertent contact when reaching load terminals?	408.3(A)(2), 408.3(D)	
235	Check for a neutral disconnecting means (neutral disconnect link).	230.75	
236	Verify rejection features are installed in current limiting fuse holders.	240.60(B)	
237	Verify interrupting ratings of all over current devices and fully rated systems. Verify if series combination ratings are permitted using either a breaker to breaker system or a fuse to breaker combination.	110.9, 110.10, 240.86, and manufacturers' instructions	
238	Verify field markings on equipment for series combination rated systems.	110.22(C)	
239	Verify selective coordination of elevator, emergency, and legally required standby system supply side over current devices.	620.62, 700.27, 708.54, 517.30(B)(2)	
240	Verify only service entrance conductors are installed in the service raceway.	230.7	
Service Grounding and Bonding Questions			
241	What size is the service?	Article 250	
242	What size is the largest service-entrance conductor?	Article 250	
243	What is the voltage involved with the service?	Article 250	
244	What type of construction is the building?	Article 250	
245	What grounding electrode(s) are present on the premises at the building or structure?	Article 250	

Number	Item	NEC or Other Reference	Comments
246	Does the grounding electrode system and other characteristics match the Code and engineered drawings?	Article 250	
247	Are all four components of the grounding and bonding scheme present at the service disconnect?	Article 250	
248	Are the minimum size grounding electrode conductor(s) and bonding jumper(s) installed?	Article 250	
249	Is the service supplied from a grounded system or an ungrounded system?	Article 250	
250	Is the grounded conductor (usually a neutral) present in each service disconnect enclosure?	Article 250	
251	Is the grounded conductor bonded to the service disconnecting means enclosure(s)?	Article 250	
252	Is the size of the grounded conductor adequate (match plans, or meets load and minimum size provisions?	Article 250	
253	Is the main bonding jumper connected at the service disconnecting means?	Article 250	
254	Are the metal enclosures and raceway containing service conductors bonded properly?	Article 250	
Service Grounding and Bonding Checklist			
255	Verify grounding requirements or specifications of any engineered drawings.	Local rule or regulation	
256	Verify the size of the service based on the plans or by the equipment labels.	Based on blueprints, 220.10, 230.42, 230.79	
257	Determine all available grounding electrodes based on the construction and plans.	250.50, 250.52(A)	
258	Determine other electrodes required to be used and bonded to the grounding electrode system.	250.52(A)(4) through (7)	
259	Verify grounding electrode conductor(s) are properly sized.	250.66, 250.64(F)	
260	Verify that bonding jumpers connecting grounding electrodes together to form the grounding electrode system are sized properly.	250.53(C)	
261	Check that grounding electrode conductor(s) is installed without a splice.	250.64(C), 250.64(F)	
262	Verify grounding electrode conductor is securely fastened and protected from physical damage.	250.64(B)	
263	Verify metal enclosures or raceways for grounding electrode conductors are bonded to the grounding electrode conductor at both ends of same.	250.64(E)	
264	Check for correct size, installation, and types of rod, pipe, or plate electrodes.	250.52, 250.53(G)	
265	Verify accessibility of grounding electrode conductor connections.	250.68(A)	
266	Check grounding electrode conductor connections including buried connections.	250.70, 250.68,	
267	Verify metal water piping system(s) are bonded.	250.104(A)	

Number	Item	NEC or Other Reference	Comments
268	Verify metal building framing is bonded.	250.104(C)	
269	Check sizes of water piping bonding jumpers.	250.66, 250.68(B), 250.104(A)	
270	Verify other metal piping systems are bonded.	250.104(B)	
271	Verify other metal piping system bonding jumper sizes.	250.104(B), 250.122	
272	Verify bonding jumpers installed around fittings and water meters, etc. and proper size.	250.68(B), 250.66	
273	Check the connection, size, and type of main bonding jumper in the service disconnect.	250.28, 250.24(A)(4),250.24(B)	
274	Verify enclosures and raceways containing service entrance conductors are bonded properly.	250.92(A), 250.92(B), 250.102, 250.190	
275	Check supply side equipment bonding jumper sizes.	250.102(C)	
276	Verify service grounded conductor is sized properly or by minimum requirements.	250.24(C), 220.61, 250.66	
Feeder Questions			
277	Do the feeders match what is shown on the single line (engineered drawings) diagrams?	Chapter 2	
278	Are single line diagrams required?	Chapter 2	
279	Is over current protection sized properly for the feeder?	Chapter 2	
280	Are the feeder conductor sizes adequate for the load?	Chapter 2	
281	Is over current protection properly coordinated?	Chapter 2	
282	What conduit types or wiring methods are used for the feeder and are the sizes adequate?	Chapter 2	
283	Are feeders installed using the provisions for tap conductors (are tap rules applicable)?	Chapter 2	
Feeders Requirements Checklist			
284	Are feeders sized to meet the loading requirements?	215.2, 215.5, 220.40, 220.61	
285	Verify panel schedules for panel board and distribution equipment ratings based on single line drawings.	215.5, 215.2	
286	Check feeder wiring methods for suitability.	Chapter 3 and 5	
287	Verify any feeder GFPE requirements have been met	215.10, 230.95, 240.13	
288	Check for feeder disconnects at separate buildings.	Article 225, Part II, 225.32	
289	Verify separate building disconnects meet the location and grouping provisions of Article 225 and 230.	Article 225, 225.34, 230.71, 230.72, 230.75	
290	Proper wiring methods used for outside feeders	225.10, 225.20 thru 225.22	
291	Verify wiring methods for feeders are continuous from enclosure to enclosure.	300.10	
292	Verify size of feeder equipment grounding conductors.	250.122	
293	Check for feeders that are installed as taps for meeting the restrictions for tap conductors.	240.21, 240.4(E) and (F)	

Number	Item	NEC or Other Reference	Comments
294	Verify feeder conductors in wet locations are listed for wet location applications.	310.8(C), 110.3(B)	
295	Verify proper over current device for feeders applied in series rated combination systems.	240.86, 110.22, 110.3(B)	
296	Verify panel boards supplied by feeders have proper over current protection.	408.36(A) and (B)	
297	Check that over current protection devices protect the Check that over current protection devices protect the feeder conductors and the equipment at the load end of the feeder.	240.4	
298	Verify the identification means for feeder grounded conductors	200.6	
299	Verify that different means of identification for feeders where more than one nominal voltage system is used and the two systems occupy the same raceways or enclosures.	215.12(A)	
300	Verify that no over current device is inserted in a feeder grounded conductor	240.22	
301	Verify there are no grounding connections to a grounded conductor on the load side of the service disconnecting means	250.24(A)(5), 250.142(B)	
302	Check for proper terminations of grounded (neutral) conductors on neutral terminal bus in panel board (only one per terminal).	408.41	
303	Verify parallel conductor installations meet all of the requirements for parallel conductors.	310.4	
304	Verify any required GFPE equipment is installed and has been performance tested prior to energizing.	215.10, 240.13, 230.95(C), 517.17	
305	Verify identification scheme for ungrounded feeder conductors has been established and posted where wiring system is supplied by more than one nominal voltage system.	215.12(C)	
Transformer Inspection Questions			
306	What wiring methods will be used, and are the wiring methods suitable for the conditions?	Article 450	
307	Where is the transformer located and is it suitable for the location?	Article 450	
308	What voltage rating will the transformer be operating at?	Article 450	
309	What type of transformer(s) will be installed (dry-type, oil-insulated, etc.)	Article 450	
310	Is the transformer readily accessible or in a hollow space?	Article 450	
311	Is properly rated over current protection provided for the transformer?	Article 450	
312	Is the adequate separation from combustibles?	Article 450	
313	Are ventilation openings free from obstructions as required by the Code and the manufacturer?	Article 450	

Number	Item	NEC or Other Reference	Comments
314	Is a transformer vault required and is it constructed to meet the minimum requirements?	Article 450	
315	Are conductor entries made in the correct locations through the transformer enclosure?	Article 450	
Transformer Inspection Checklist			
316	Check wiring methods (usually conduit and flexible metal conduit) for support and suitability for the conditions.	Chapter 3 and Article 300, 300.11	
317	Verify the transformer installation covered by Article 450.	450.1, 450.2, 90.2	
318	Verify over current protection for over 600 volt transformers is in accordance with 450.3(A).	450.3, 450.3(A) and notes, Table 450.3(A)	
319	Verify over current protection for transformers 600 volts or less is provided and properly sized.	450.3, 450.3(B),Table 450.3(B)	
320	Verify conductor sizes on the primary and secondary.	240.4, 310.15, 310.16	
321	Verify compliance with applicable secondary tap rules.	240.21(B) and (C)	
322	Check over current protection for protection of conductors.	240.4, 240.6, 240.21(B) and (C), 240.100, 310.16	
323	Verify clearances and working space around transformer and specifically ventilating openings in accordance with markings	450.9, 110.3(B), 110.26	
324	Verify transformer is readily accessible or complies with the hollow space or exposed locations provisions.	450.13	
325	Verify transformers installed indoors meet the separation requirements or fire resistant room requirements.	450.21	
326	Verify weatherproof enclosures are installed on outdoor dry-type transformers.	110.3(B), 450.22	
327	Check for oil-filled transformer requirements such as separations, oil containment, etc.	450.23 thru 450.28	
328	Verify transformer vaults meet all of the conditions for construction of vaults	450.41 thru 450.48	
329	Verify metal parts and enclosures associated with transformers are grounded. If transformer is a derived system, grounding in accordance with 250.30.	450.10, 250.20, 250.30	
330	Verify any parallel conductors connected to transformers meet the requirements in Chapter 3.	Article 300, 310.4, 250.122, 250.30(A)(5)	
Separately Derived System Grounding and Bonding Questions			
331	What size(s) is or are the separately derived system(s)?	Article 250	
332	What size(s) is the largest derived phase conductor?	Article 250	
333	What type of construction is the building relative to electrode choices?	Article 250	
334	What grounding electrode(s) are available on the premises at the building or structure?	Article 250	

Number	Item	NEC or Other Reference	Comments
335	Does the grounding electrode system and other characteristics match the engineered drawings?	Article 250	
336	Are all four components of the grounding and bonding scheme present at each separately derived system?	Article 250	
337	Are the minimum size grounding electrode conductor(s) and bonding jumper(s) installed?	Article 250	
338	Is the separately derived system a grounded system or an ungrounded system?	Article 250	
339	What types of separately derived systems are installed?	Article 250	
340	If generators are installed, what type of transfer equipment is used?	Article 250	
341	Is the size of the grounded conductor adequate?	Article 250	
342	Is the system bonding jumper connected at the source enclosure or first system over current device enclosure?	Article 250	
343	Are the metal enclosures and raceway containing derived phase conductors bonded properly?	Article 250	
Separately Derived System Grounding and Bonding			
344	Verify grounding requirements or specifications of any engineered drawings.	Local rule or regulation	
345	Verify the size of the system based on the plans or by the equipment labels.	Based on blueprints or load served, 220.10	
346	Determine all available grounding electrodes based on the construction and plans.	250.50, 250.52(A)	
347	Determine which electrode(s) required to be used (as near as practicable and in the same area.	250.30(A)(7)	
348	Verify grounding electrode conductor(s) are properly sized.	250.66, 250.30(A)(3)	
349	Verify that system bonding jumper is connected and sized properly.	250.30(A)(1), 250.28, 250.66	
350	Check that grounding electrode conductor(s) is installed without a splice.	250.64(C)	
351	Verify grounding electrode conductor is securely fastened and protected from physical damage.	250.64(B)	
352	Verify Metal enclosures or raceways for grounding electrode conductors are bonded to the grounding electrode conductor at both ends of the enclosure or raceway.	250.64(E)	
353	Verify any installed equipment bonding jumpers between source enclosure and first system over current device enclosure sized properly.	250.30(A)(2), 250.35, 250.66, 250.102(C) and (D)	
354	Verify accessibility of grounding electrode conductor connections.	250.68(A)	

Number	Item	NEC or Other Reference	Comments
355	Insure that a grounding conductor that provides an effective ground-fault current path is installed with the supply conductors from a permanently installed generator(s) to the first disconnecting mean(s)	250.35	
356	Check grounding electrode conductor connections including buried connections.	250.70, 250.68, 110.3(B)	
357	Verify metal water piping system(s) are bonded.	250.104(A), 250.30(A)(7)	
358	Verify metal building framing is bonded.	250.104(C), 250.30(A)(6)	
359	Check sizes of water piping bonding jumpers.	250.66, 250.68(B), 250.104(A)	
360	Check grounding and bonding connections in source enclosures and first device enclosure.	250.8, 110.3(B), 250.90, 250.96	
361	Verify other metal piping system bonding jumper sizes.	250.104(B), 250.122	
362	Check that the grounding electrode conductor and bonding jumper connections for the system are in the same location.	250.30(A)(1), 250.30(A)(3)	
363	Check the connection, size, and type of system bonding.	250.30(A)(1), 250.28	
364	Verify enclosures and raceways containing (tap) derived phase conductors are bonded properly.	250.92(A) and (B)	
365	Check supply side equipment bonding jumper sizes.	250.30(A)(4)	
366	Verify system grounded conductor is sized properly or by minimum requirements.	250.30(A)(8), 250.66, 220.61	
367	Verify identification for grounded conductor at source enclosure and first system over current device enclosure.	200.6	
368	Verify grounding and bonding connections are tight and made with equipment listed as grounding and bonding equipment.	110.12, 110.14, 250.8, 250.96	
369	Verify the water piping in the area served by the derived system is bonded to the derived system.	250.104(A), 250.30(A)(7)	
Electric Motor Inspections Questions			
370	What wiring methods will be used, and are the wiring methods suitable for the conditions?	Article 430	
371	Where is the motor located and is it accessible for servicing?	Article 430	
372	What specific information is known about the motor (voltage, phase, horsepower rating, service factor, and full-load current, etc.)?	Article 430	
373	What are the conductor ampacities associated with the motor installation?	Article 430	
374	Is properly rated motor short-circuit ground-fault protection in place?	Article 430	
375	Is properly rated motor overload protection provided if required?	Article 430	
376	Are the controllers and disconnects properly rated for FLA and LRA?	Article 430	

Number	Item	NEC or Other Reference	Comments
377	Do motor control centers have proper ratings, locations, working space and dedicated spaces?	Article 430	
378	Are disconnects provided and located properly for the motor(s) and controllers(s)?	Article 430	
379	Are motor disconnects provided, and properly located, or are the controller disconnects?	Article 430	
Motor Inspection Checklist			
380	Check wiring methods (usually conduit and flexible metal conduit) for support and suitability for the conditions.	Article 300, 300.11	
381	Determine the FLA ratings of the motors from the Table values based on HP and voltage and number of phases.	Article 430, Tables 430.247 through 430.251	
382	Verify branch circuit conductor sizes for single motors or multiple motors on the same circuit (125% of Table values).	430.22, 430.24	
383	Verify feeder sizes where multiple motors are installed on the feeder.	430.24	
384	Verify short-circuit ground-fault protection for motor and motor branch circuit(s).	430.52, Table 430.52	
385	Verify short-circuit ground-fault ratings of motor feeders.	430.61 thru 430.63	
386	Verify motor control circuit over current protection.	430.71 thru 74	
387	Verify motor control circuit disconnect and proper arrangement of control circuits is provided.	430.74, 430.75	
388	Verify the location of motor control centers and ratings.	430.92 thru 430.98, 110.26	
389	Check the rating of the motor overload protection and compare to motor nameplate current values.	430.6, 430.31, 430.32	
390	Verify the motor disconnecting means has proper ratings and is a suitable type.	430.109, 430.110	
391	Verify location of motor controller disconnect(s) in sight from and readily accessible from the controller location and verify adequate working space is provided.	430.102(A), 430.107, 110.26	
392	Verify motor disconnecting means is in sight from the motor location and has adequate working space or complies with the lockable disconnect provisions.	430.102(B), 430.102(B) Ex	
Air Conditioning Equipment Inspections Questions			
393	What wiring methods will be used, and are the wiring methods suitable for the conditions?	Article 440	
394	Where is the equipment located and is it accessible for servicing?	Article 440	
395	What are the conductor ampacities associated with the equipment installation?	Article 440	
396	Is properly rated short-circuit ground-fault protection in place?	Article 440	
397	Is properly rated overload protection provided if required?	Article 440	

Number	Item	NEC or Other Reference	Comments
398	Are the controllers and disconnects properly rated for FLA and LRA?	Article 440	
399	Do motor control centers have proper ratings, locations, working space and dedicated spaces?	Article 440	
400	Are disconnects provided and located properly for the equipment controllers?	Article 440	
401	Are equipment disconnects provided, and properly located, or are the controller disconnects?	Article 440	
Air Conditioning Equipment Inspections Checklist			
402	Check wiring methods (usually conduit and liquid tight flexible metal conduit) for support and suitability for the conditions.	Article 300, 300.11	
403	Verify that Article 440 is applicable to the equipment (the equipment incorporates a hermetic refrigerant motor compressor).	440.1, 440.2	
404	Verify there is applicable nameplate information provided for the equipment.	440.4	
405	Verify the branch circuit conductor sizes are proper.	440.31 thru 440.35	
406	Verify the conductors supplying multiple units are properly sized.	430.24, 430.25, 440.35	
407	Verify branch circuit overload protection is provided and is sized properly.	440.51 thru 440.55	
408	Verify the size of the branch circuit short-circuit ground fault protection is properly sized (nameplate).	440.21, 440.22	
409	Verify short-circuit ground-fault protection is provided for feeders if applicable and is sized properly.	430.61 thru 430.63	
410	Verify controllers have proper ratings were not supplied as an integral component of the equipment.	440.41	
411	Check the ratings of disconnecting means for LRA and RLA values that meet the requirements.	440.12, 440.13	
412	Verify disconnecting means locations and applicable working spaces are provided.	440.14, 110.26	
413	Verify size and lengths of room air-conditioner cords.	440.60 thru 440.64	
414	Verify that room air-conditioners are factory equipped with either LCDI or AFCI protection as part of the supply cord.	440.65	
415	Verify service receptacles and appropriate lighting outlets and switches are provided.	210.63, 210.70	
416	Verify equipment is listed and installed properly.	90.7, 110.2, 110.3, 110.3, 110.3(B)	
Emergency Electrical System Requirements Questions			
417	What type of occupancy and what type of emergency system is required?	Article 700	
418	What is required or permitted as the emergency system source of power?	Article 700	

Number	Item	NEC or Other Reference	Comments
419	What type of transfer equipment is installed and where is it located?	Article 700	
420	What is the location of the emergency system power source?	Article 700	
421	What are the wiring methods used for the emergency feeders and branch circuits?	Article 700	
422	Are the appropriate separations between normal circuits and emergency circuits provided?	Article 700	
423	Is there a fire pump, if so, what is the location and what are the power sources?	Article 700	
424	What type of witness test is to be conducted prior to acceptance?	Article 700	
425	Are emergency system enclosures properly identified?	Article 700	
426	Is the equipment suitable for use on an emergency system?	Article 700	
427	What is the egress path required by the applicable building code?	Article 700	
428	Are fire rated assemblies required for emergency feeder protection?	Article 700	
Emergency System Requirements Checklist			
429	Establish that Article 700 applies to the type of occupancy and electrical system.	Applicable building code or local code and Article 700	
430	Review engineered drawings for specifications.	Local Code(s) and 700.9©	
431	Determine the emergency system source to be used based the drawings and at a minimum:	700.12	
432	Check equipment being used on emergency system for suitability.	700.3, 110.3(A) and (B)	
433	Verify connected emergency system load and capacity of the emergency system.	700.4, 220.10, 215.2	
434	Verify capacity meets load demand or load shedding is provided.	700.5	
435	If generator is the source, verify onsite fuel is provided (for minimum 2-hours operation).	700.12(B)(2)	
436	Power sources are suitable for minimum 1-1/2 hours of operation and transfer is within 10 seconds.	700.12	
437	Verify unit equipment is connected to the proper lighting circuits.	700.12(F)	
438	Check for dimmer systems (listed for use in emergency systems) and ability upon power failure to illuminate selected emergency circuits.	700.23	
439	Verify transfer equipment is suitable for the use and is automatic type.	700.5	
440	Transfer equipment supplies only emergency loads and is listed for emergency systems	700.5(C) and (D)	
441	Determine if transfer switch creates a separately derived system.	250.20(D),250.30(A)	

Number	Item	NEC or Other Reference	Comments
442	Emergency system branch circuit over current devices accessible to authorized persons only.	700.25	
443	Check for emergency system signage at service equipment (disconnecting means) location.	700.7	
444	Check for feeder and branch circuit wiring separation from normal circuits.	700.10(D)	
445	Conduct a witness test of the system (loads connected).	700.3, 701.3	
446	Check all enclosures are identified as part of an emergency system	700.10(A)	
447	Verify proper separation of emergency, legally required standby and optional standby systems at first disconnecting means.	700.10(B)(5)	
448	Verify required visible and audible emergency system status signals are provided and the locations.	700.7, 700.10(A), 700.26	
449	Check for fire rated feeders in high-rise buildings and assembly occupancies over 1000 persons.	700.10(D)	
450	Verify emergency branch circuits supply only emergency loads (See 517 for health care facilities).	700.15	
451	Verify re-strike capabilities or provided illumination where HID lighting is used as the normal lighting (done usually during witness test)	700.16	
452	Check that areas in egress path will not be left in total darkness with the failure of a single lighting element.	700.16	
453	Check any fire pump installations for compliance with Article 695 and NFPA 20.	Article 695, NFPA 20	
454	Verify any switches located in emergency lighting circuits are accessible only to authorized persons.	700.20, 700.21	
Final Electrical Inspections Questions			
455	Are the circuit directories and disconnecting means identification in place?	Article 110	
456	Are all covers installed on electrical switchboards, panel boards, and other enclosures?	Article 110	
457	Are unused openings in any enclosure effectively closed?	Article 110	
458	Are the properly rated devices installed and device cover plates installed?	Article 110	
459	Are the required fire penetrations sealed properly?	Chapter 3	
460	Is the emergency system completed and identified?	Chapter 7	
461	Has the emergency system been tested under witness?	Chapter 7	
462	Is all mechanical equipment disconnecting means in place?	Article 430	
463	Are all required GFCI circuits and receptacles installed?	Articles 110, 230, 250, 430, etc.	

Number	Item	NEC or Other Reference	Comments
464	Are the service receptacles for heating and air-conditioning equipment located within 25 feet of equipment?	Article 440	
465	Are all luminaries (lighting fixtures) installed?	Article 410	
466	Have GFP equipment test results been provided (if applicable)?	Various	
467	Have any and all revisions or deviations from the original engineering design been documented in writing?	Authority Having Jurisdiction	
468	Are required arc flash warning labels in place?	110.16	
Final Electrical Inspection Checklist			
469	Determine which installations or portions of the installations are covered by NEC rules.	90.2(A) and (B)	
470	Verify equipment is listed and installed in accordance with manufacturer's installation instructions.	90.7 and 110.3(B)	
471	Verify circuit directories and disconnecting means identification is provided.	110.22, 408.4	
472	Verify GFCI protection at required locations.	210.8(B), 422.51, 422.52	
473	Verify all covers installed and unused openings are closed	110.12(A)	
474	Verify all properly rated devices (switches and receptacles) are installed.	210.21, 404.14, 406.2	
475	Check to see that all luminaires are listed.	410.6	
476	Verify weatherproof receptacle covers in place in damp and wet locations.	406.8(A) and (B)	
477	Verify weather-resistant type receptacles are installed outdoors in damp and wet locations.	406.8(A), 406.8(B)	
478	Check for GFPE test results (if applicable) Healthcare facilities (hospitals) require six-cycle separation.	230.95(C), 517.17(C)	
479	Check for arc flash warning labels on applicable equipment enclosures.	110.16	
480	Check for required service receptacle within 25 feet and on the same level as the equipment location	210.63	
481	Verify emergency system identification and witness testing is completed.	700.3, 700.10(A), 701.3	
482	Verify locations of HVAC equipment disconnecting means.	440.14	
483	Verify locations of motor disconnecting means.	430.102	
484	Verify correction factors have been applied to conductors installed on or above rooftops exposed to direct sunlight.	310.15(B)(2)(c), 310.15(A)(2) Exception	
485	Verify field markings on equipment for series combination rated systems.	110.22(C)	
486	Verify identification of circuit conductors permanently posted at each branch circuit panel board or other distribution equipment with building is supplied by more than one nominal voltage	200.6(D), 210.5(C), 215.12(C)	

	system.		